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The thick of things

Thin film work is poster child for getting R&D to industry

By Sue Major Holmes

Sandia researcher Paul Vianco sees his work on thin films as a poster child for the way research and development based on nuclear weapons work can boost US industry.

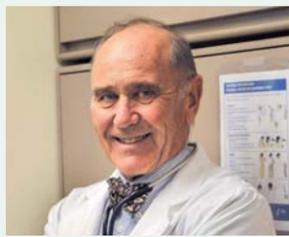
Since the 1970s, Laboratories researchers have taken studies originally performed to support the weapons program and published or presented parts of the work at technical conferences. Paul (1831) calls that passive tech transfer.

“Engineers would just fill rooms. They wanted to hear what we were doing, not only because our research represented the ‘latest-and-greatest,’ but more so because it was applied technology,” he says. “This was information that folks ate up because they could take it back to their companies and put it directly to use on their products.”

Paul recently won the Surface Mount Technology Association’s 2015 Best of Proceedings award for the paper “Establishing a Ti-Cu-Pt-Au Thin Film on Low Temperature Co-Fired Ceramic Technology for High-Temperature Electronics.” Co-authors were Jerome Rejent (1831), Alice Kilgo, Bonnie McKenzie, and Amy Allen (all 1819); Mark Grazier, recently retired

(Continued on page 4)

SANDIA RESEARCHER Paul Vianco works on thin films, nanometer-thick layers of metal that can be defined into precision electrical circuits. He won the Surface Mount Technology Association’s 2015 Best of Proceedings award and will be honored with other winners at the association’s meeting in September. (Photo by Randy Montoya)



The doctor is in: Meet Sandia’s new medical director

Arthur Vall-Spinosa is someone you want to know. He’s a doctor and a teacher, a public servant, and a sailor. And he’s the new head of Sandia’s medical operations. Art brings decades of experience as a health-care pioneer and leading pulmonologist to the Labs. Read about his life and early years as a physician on the Navajo Reservation on pages 6-7.



Labs Director Jill Hruby answers questions about M&O contract bidding process

During the contract competition, know the rules and keep focused on the mission

In a Q&A session regarding DOE/NNSA’s soon-to-be-released final request for proposal (RFP) on the Labs’ management and operating contract, Sandia President and Laboratories Director Jill Hruby empha-

and our people.”

In a session before an audience in the Bldg. 810 auditorium and streamed live to desktops around the Labs, Jill and acting VP for Legal and Prime Contract Marianne Hill

“There is one very simple rule that we’re trying to make everyone aware of: Don’t talk about things that aren’t public — which means the details of your job, your boss, the program unit. During the contract competition, just be a little bit more careful about things you might normally talk about because you don’t know why people are probing.”

— Sandia President and Labs Director Jill Hruby



sized that the Labs leadership’s main goals during the contract bid phase are “to make sure the competition goes as smoothly as possible, at least so far as it concerns us, and to minimize the disruption of our work

answered questions covering a range of issues about the bid process. Jill and Marianne’s answers were based largely on the contents of the draft RFP; at the time of the session, (Continued on page 5)

Autoignition

Sandia researchers have developed a model for autoignition in diesel engines that plays an important role in determining engine efficiency and formation of pollutants. Story on page 3.



Early career award

Sandia researcher Robert Kolasinski won an Early Career Research Program award from DOE’s Office of Science to support his work on intense fusion plasmas. Story on page 3.

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SANDIA’S EMS EXCELLENCE AWARDS, announced on April 28, recognize notable efforts around the Labs to conserve natural resources, minimize environmental footprints, and reduce, reuse, and recycle materials. See the story on page 10.

Take Our Daughters and Sons to Work Day

Sandia/New Mexico hosted 1,588 students on April 28 for a combined celebration of Take Our Daughters and Sons to Work Day plus Earth Day. Story and photos on page 12.



That's that

We all know about bugs in computer systems. Urban legend – and it *is* an urban legend – has it that the term originated when a real bug crossed up some circuits in an early computer, Harvard University's Mark II machine. But bugs are small potatoes. Turns out that the folks who operate the Large Hadron Collider in the Swiss countryside near Geneva wish that bugs, real or virtual, were all they had to worry about. Their problems are way hairier than that. It seems that a small mammal, possibly a weasel, chewed through some of the device's wiring, shutting down the system for what could be several weeks.

The LHC is an icon of Big Science – and a monument to the human spirit. The \$7 billion device with its 17-mile ring of superconducting magnets is the world's largest particle collider. Using the device, researchers in 2012 identified a particle suspected to be the elusive Higgs boson, a huge breakthrough in particle physics. More recently, researchers working at the LHC have identified whole new classes of particles they're calling pentaquarks. As one lead researcher put it, "Studying [the pentaquark's] properties may allow us to understand better how ordinary matter, the protons and neutrons from which we're all made, is constituted."

LHC epitomizes the very best of what it means to be human: We, collectively, are willing to make huge investments in research with no immediate, obvious payoff, and very smart people are willing to spend decades of their lives preparing themselves to be able to take advantage of the power of the LHC, all to answer questions that we just recently knew to ask.

The LHC and other Big Science investments like Sandia's Z machine and Lawrence Livermore's National Ignition Facility are tools of exploration and discovery that carry us to new frontiers just as surely as did the sailing canoes of the Polynesians and the spacecraft that are even now hurtling into interstellar space. We do the LHC and the other things because it is our nature; we are the exploring species. And weasels? Well, they chew wires because it is their nature. And because they taste so good!

* * *

I got an unsolicited email in my personal account at home the other day inviting me to give a speech on geothermal energy at an upcoming international conference. This "invitation" was totally out of the blue and off the wall – I'm no geophysicist – but in the world of spam, this was one of the more original approaches I've seen in a while. I was tempted to accept the invitation contingent on the sponsors meeting a list of non-negotiable demands: all expenses paid – first-class airfare, four-star hotel, the works. You want my take on geothermal energy, baby, you're gonna pay, and pay big. (Actually, I ignored the email since the link where I was supposed to confirm my intentions looked extremely phishy to me.)

My speech, had my demands been met, would have been distinctly brief. Almost everything I know about geothermal energy I learned by reading the interpretive sign at Old Faithful in Yellowstone.

Why did I even get this message? Well, my grandfather was a geologist and my father was a cartographer with the US Geological Survey who studied geology at Michigan Tech. I'm a member of the National Geographic Society and I think I signed the guest register at the hot springs in Pagosa Springs a few months ago. Maybe that makes me some sort of expert. Anyhow, I suspect the keynote speaker will be an exiled Nigerian prince who's looking for funding to develop secret geothermal resources near Lagos. He has a map.

* * *

Speaking of unsolicited emails, another one that somehow didn't find its way directly to the junk folder was from a psychic who wrote, "I just received your request for my personalized astrological predictions . . ." No, actually you didn't.

When you're on the receiving end of these email scams, you expect them to be smart or at least vague enough so that they can seem "accurate" no matter how you read them. But this psychic was a risk-taker: She was quite specific in her misinformation. She wrote: "Because you were born on December 31st in 1947 your aura is much stronger than you think. There were so many signs that have appeared to me, I couldn't remain silent and indifferent."

Sorry, wrong birthday! Not a good way to instill confidence in your psychic gifts. Tends to foster a healthy dose of skepticism. Now, on this subject, it so happens that I have a bit of psychic ability myself. Despite her claims that she can't remain silent and indifferent to my aural signature, I predict I'll never hear from this psychic again unless I fork over my credit card number.

May the 4th be with you.

– Bill Murphy (MS 1468, 505-845-0845, wtmurph@sandia.gov)

2016 ELECTRICAL SAFETY MONTH

SAFETY FAIR & LESSONS LEARNED FORUM

WEDNESDAY MAY 18

9:00-11:00 AM

STEVE SCHIFF AUDITORIUM

EARN 1,000 VIRGIN PULSE POINTS!

KEYNOTE SPEAKER
LLOYD GORDON
LOS ALAMOS NATIONAL LABS

SHARING LESSONS LEARNED FROM A 2015 ARC FLASH INCIDENT THAT INJURED AN ELECTRICIAN

INFO BOOTHS
PNM ELECTRICAL SAFETY, SUSPECT/COUNTERFEIT ITEMS, NON-NRTL INSPECTORS, SAFETY TRAINING, CPR DEMONSTRATION, LIVESAFE

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SCHEDULE OF EVENTS

Performances and Lectures

- 10 a.m. - Opening Ceremonies
- 10:20 a.m. - Lion Dance and Martial Arts - Chinese Cultural Center & Lin's Martial Arts Academy
- 11:15 a.m. - Lecture – Chinese Medicine: Stress, Hormones, and Health - Dr. Reba Eagles with Original Medicine Acupuncture & Wellness
- Noon - Children's Dance Group - New Mexico School of Chinese Language & Arts
- 12:30 p.m. - Thai Dance Performance – Wat Buddhamongkolnimit
- 1 p.m. - Lecture – Two Centures and Counting: A History of Asians in New Mexico - Rick Hendricks, PhD, NM State Historian
- 1:45 p.m. - Kuyadisa Nuchibana Uchina Uchina – New Mexico Branch of Miyagi Ryu Noshō Kai School of Okinawa Dance
- 2:15 p.m. - Taiko Drumming – BK Taiko
- All Day - Ikebana Flower Arrangements – Ikebana International Chapter 41
- All Day - Ikebana Floral Arrangement – Japan America Society of NM, Inc. and Ichiyo School of Ikebana – Albuquerque

Food Sampling

- 11:30 a.m. to 1:30 p.m. (or until samples run out) - Provided by Talin Market and Lin's Chinese Restaurant

Origami, Calligraphy and Brush Painting

- 11 a.m.- 2 p.m. - Provided by the New Mexico School of Chinese Language & Arts

Vendor Booths

Throughout the Day - Asian Family Center, Body and Brain Yoga, and Original Medicine Acupuncture & Wellness

Asian Pacific Islander American Heritage Festival

Activities all day
beginning at 10 a.m.

May 14, 2016

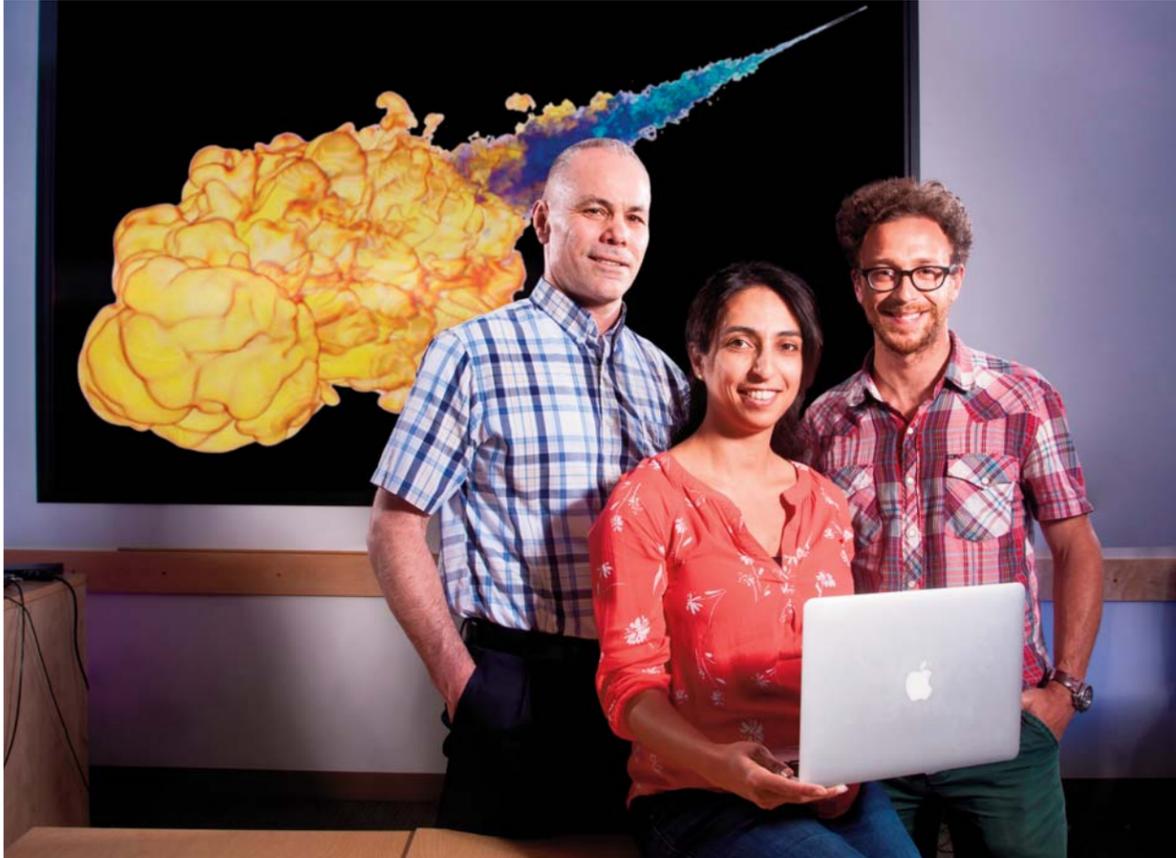
Schedule of events:
<http://goo.gl/kABXt4>

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Start your engines!



Sandia researchers develop autoignition model designed for efficient, accurate engine simulations



AUTOIGNITION MODELING — Loyal Hakim (front), working with Joe Oefelein and Guilhem Lacaze (all 8351), successfully designed and implemented an optimized chemical model that describes autoignition of a diesel fuel surrogate. (Photo by Randy Wong)

By Michael Padilla

Sandia researchers have developed a model for autoignition in diesel engines that plays an important role in determining engine efficiency and formation of pollutants.

Sandia postdoctoral researcher Loyal Hakim, working with mentors and Sandia principal investigators Guilhem Lacaze and Joe Oefelein (all 8351), designed and implemented an optimized chemical model that describes autoignition of a diesel fuel surrogate with quantified uncertainty quantification. This model is a key component in

developing simulations that provide an unprecedented level of insight into the effect of high-pressure liquid injection, fuel chemistry, and turbulent mixing on diesel combustion efficiency and emissions characteristics.

The research, published in April in the *SAE International Journal of Fuels and Lubricants*, is titled “Large Eddy Simulation of Autoignition Transients in a Model Diesel Injector Configuration.”

“Given environmental concerns, there’s a pressing need to develop more efficient and cleaner engines and fuels,” Loyal says. “One bottleneck is understanding oxidation of large hydrocarbon fuels over a wide range of operating conditions.”

Because diesel fuels are composed of thousands of chemi-

cal species, detailed kinetic models are typically not practical for direct use in simulations. Thus, surrogate fuels composed only of a few components are used to approximate the physical and chemical properties of real fuels.

“We use n-dodecane in our simulation as a surrogate fuel to mimic diesel. But while detailed mechanisms are an active research topic to model and understand the chemical behavior of such surrogates, we still need a more affordable representation of the subtleties of the n-dodecane chemistry when we study the key physics that lies in the combination of mixing and chemistry. This is where our chemical model has proven its usefulness,” she says. “The physical processes in diesel jet injection and ignition are still not fully understood and experiments, while invaluable, can only provide a limited level of detail. Therefore, numerical simulations are good candidates to reveal missing information.”

The group collaborated with Mohammad Khalil, Khachik Sargsyan, and Habib Najm (all 8351) for their expertise in uncertainty quantification.

“Quantifying the impact of uncertainties introduced by such a chemical approximation of the simulation predictions is crucial for providing meaningful data,” Loyal says.

Understanding the fundamental processes that lead to autoignition can help engine design and optimization because the timing and location of ignition have a direct bearing on system efficiency and emissions. The spatial and temporal fidelity of these calculations provide access to full broadband three-dimensional characteristics of injection, ignition, and combustion.

The lack of accurate models representing the physics of injection, vaporization, turbulent mixing, and ignition is a major barrier to the design of new engines. Thus, simulations conducted for this research can provide complementary high-resolution data beyond what can be measured in experiments to better understand diesel jet mixing and ignition. The simulations aim to complement key experiments by providing benchmark data at the same conditions to test and improve engineering approaches used in industry.

Studies such as these contribute to the whole engine community through Sandia’s Engine Combustion Network. A future goal is to perform joint comparisons that use data generated here to understand the accuracy of models used in engineering codes.

This published research fits into the philosophy of Sandia’s Combustion Research Facility where simulations complement experiments and bring key insights to improve real engines.

Robert Kolasinski wins DOE Early Career Award

By Michael Padilla

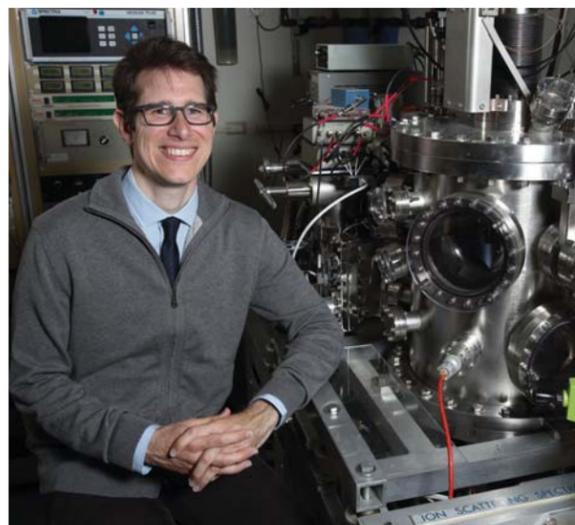
Sandia researcher Robert Kolasinski (8366) has received a \$2.5 million, five-year Early Career Research Program award from DOE’s Office of Science to support his work on how intense fusion plasmas interact with the interior surfaces of fusion reactors. Robert’s research will develop the scientific foundations needed to determine how reactor surfaces change in harsh plasma environments and to identify mechanisms that limit material lifetime.

“This award provides a great opportunity to lay a foundation for understanding materials for fusion energy,” Robert says. “I am grateful to the Office of Science for this honor and for their support of our work. The next five years will be very exciting.”

Robert’s winning submission, “Characterizing the Dynamic Response of Surfaces to Plasma Exposure,” was selected by the Office of Fusion Energy Sciences, which supports a broad range of plasma physics research activities.

“Understanding how materials interact with plasmas is a daunting scientific challenge and presents one of the most significant barriers to the realization of magnetic fusion as an energy source,” Robert says. “My submission seeks to examine the physical mechanisms that govern the evolution of surfaces during exposure to low-energy hydrogen and helium plasmas produced within magnetic fusion experiments.”

Perhaps Robert’s biggest challenge will be to probe surface properties during plasma exposure without having to infer them from post-test analyses. Robert plans to use a variety of experimental approaches, including photon-based spectroscopies, ion beam analysis, and surface science techniques. Those measurements span the broad range of length scales needed to understand how atomic-scale defects evolve



ROBERT KOLASINSKI has received a \$2.5 million, five-year Early Career Research Program award from the DOE Office of Science. (Photo by Dino Vournas)

into larger defect structures, he says.

In addition to hydrogen plasma-surface interactions, Robert’s research at Sandia examines generally how hydrogen gas interacts with materials. This includes work with metal hydrides, a convenient storage material for hydrogen gas in fuel cell electric vehicles and other applications.

Robert also specializes in a unique surface science technique known as low-energy ion scattering, which precisely analyzes collisions between ions and surface atoms. Ion scattering is one of the only forms of surface analysis sensitive to

hydrogen and so can provide insights into rate-limiting mechanisms at material interfaces that affect hydrogen uptake.

Robert says he likes to encourage young women and men interested in pursuing careers in science and engineering.

“In addition to having good technical skills and depth of knowledge in one’s field, I think a willingness to build collaborations is essential,” he says. “Science is not an individual endeavor; it is multidisciplinary. A wide range of expertise is required to tackle the most difficult scientific challenges.”

“Working at any of the national labs is a great way to start your career as a researcher. I have been fortunate to work in such a collegial research environment at Sandia with many exceptional mentors. In addition, I also was able to participate in an Early Career Laboratory Directed Research and Development program in my first two years as a staff member that helped me develop some of the experimental techniques that I will be applying to this DOE Office of Science award.”

Robert began his career at Sandia as a postdoctoral Fellow in 2006 and became a permanent member of the staff in 2009. He earned his doctorate from the California Institute of Technology in mechanical engineering. His thesis on spacecraft propulsion — specifically ion-surface interactions in plasma thrusters — was a collaboration with colleagues at NASA’s Jet Propulsion Laboratory. He received his undergraduate degree in mechanical engineering with a concentration in aerospace from Rutgers University.

Robert is one of 49 Early Career Research Program recipients from 22 national labs and 27 US universities chosen by peer review. The goal of the program is to bolster the nation’s scientific workforce through support for exceptional researchers during the crucial early career years, when many scientists do their most formative work.

Thin films

(Continued from page 1)

“Engineers would just fill rooms. They wanted to hear what we were doing, not only because our research represented the ‘latest-and-greatest,’ but more so because it was applied technology.”

— Sandia researcher Paul Vianco

from Sandia; and William Price of the Kansas City National Security Campus (KCNSC) and Esteban Guerrero, now retired from KCNSC. The winners of the Best Papers awards will be honored Sept. 27 at the association’s conference in Rosemont, Illinois. Paul also won the Best of Proceedings paper in 2012.

Thin films are nanometer-thick layers of metal that can be defined into precision electrical circuits similar to traditional printed circuit boards. Instead of a laminated or built-up copper conductor circuit, a thin film is patterned into a circuit through photolithography techniques. The benefit is miniaturization with finer lines and spaces, so the electronic component can be made smaller and do more at the same time.

“Smaller components weigh less and use less power,” says Paul. “We reduce what industry refers to as ‘SWaP,’ or size, weight, and power.”

Data could help further develop components

Sandia’s paper provides the electronics industry with data that can be used to further develop thin film-on-low temperature co-fired ceramic (LTCC) components – called hybrid microcircuits – for high-temperature electronics. Paul envisions a new generation of such LTCC components that will combine miniaturization, functionality, and the ability to withstand harsh environments, and which are fabricated by commonly used photolithography processes.

“The solder interconnection reliability data will enable use of these products in applications that include down-hole oil and gas exploration as well as renewable energy development,” Paul says. Such hybrid microcircuits also have significant potential for sensors and communications electronics in space probes, he says.

Sandia has been collaborating with the Kansas City National Security Campus since KCNSC’s breakthrough devel-

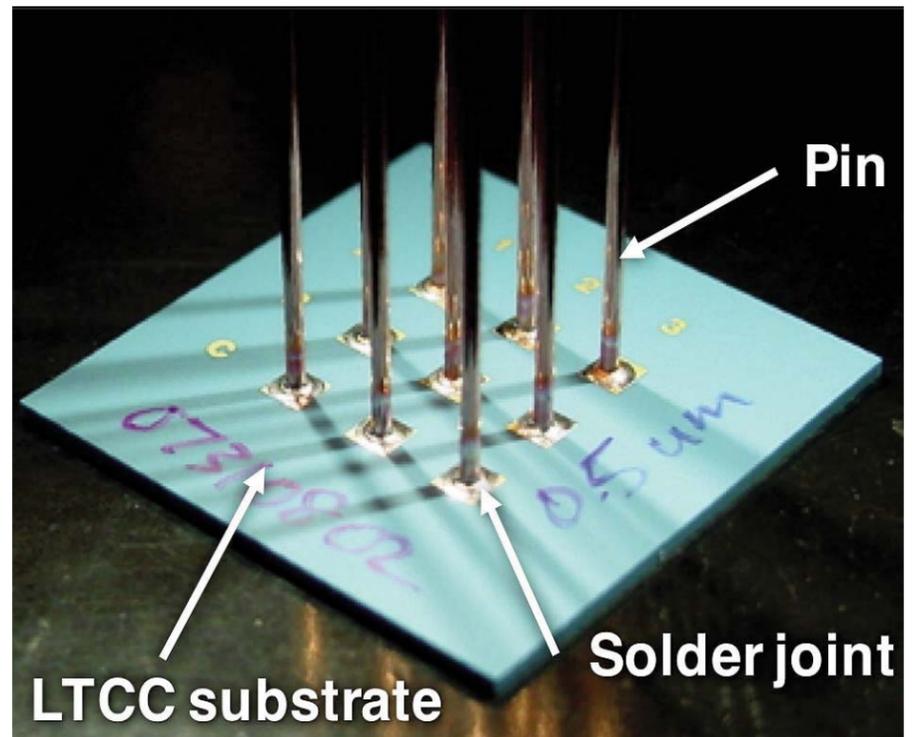
opment of LTCC technology on thin film a few years ago. The research was funded by the nuclear weapons life extension program at Sandia as well as Sandia’s and KCNSC’s Enhanced Surveillance Campaigns, which support stockpile stewardship. KCNSC built the LTCC and deposited the thin films, while Sandia developed and implemented test procedures and used its advanced microanalysis capabilities for failure mode analyses.

Paul praised the collaboration.

“It’s really a case where we took the application, understood what information was needed to ensure producibility and reliability of the solder interconnections, and developed a test in collaboration with our KCNSC partners. The result was strength and failure analysis information that significantly enhanced the ability of Sandia to design new components and of KCNSC to fabricate them into high-reliability products,” he says. “We’ve sort of come full circle: We identified the need, developed an experiment, and obtained test data that supported the application. Publishing the results made the data available to the US electronics industry.”

Offers industry new applied technology

The award-winning study evaluated the mechanical properties of solder joints made to a thin film conductor pattern deposited on the surface of an LTCC substrate. Co-fired means individual layers, stacked on one another, are fired together at high temperatures to create the internal, multilayer circuitry and interconnections that are hallmark LTCC technology. Paul and his colleagues developed a standard method to assess solder joint strength on the advanced thin film circuits. The approach provides a way to define assembly processes and determine the long-term reliability of solder interconnections for critical, high-frequency components.



TEST SPECIMEN — Researchers used the novel test specimen pictured here for the work behind an award-winning paper that evaluated the mechanical properties of solder joints made to a thin film conductor pattern deposited on a low temperature co-fired ceramic substrate. (Photo courtesy of Paul Vianco)

“Thin film conductors are not a new circuit technology, but they are still in relative infancy in the high-reliability electronics industry,” he says. “A lot of hybrid microcircuits still rely upon the old thick film conductor technology, which uses screen or stencil printing to define the electrical circuit. We’ve used it for years on high-frequency components. But it’s limited in terms of achieving better SWaP for those products because we can’t miniaturize it very much more than we’ve already done.”

The electronics industry wants to improve product performance, but often hasn’t fully appreciated the intricacies of interconnections-plus-thin films as a materials system, he says. “It’s been kind of a mystery in terms of how solder joints made to thin film conductors stay attached to the LTCC substrate, but I think they now see that what we’re doing is valuable in furthering this technology. For those who never thought of using thin film-on-LTCC, those folks are saying, ‘Maybe now we do know enough about this technology to try it on our products.’”

Sandians show their muscle at classic cool car show



Photos by Randy Montoya

It started out as a team-building activity for Logistics Operations Center 10200 three years ago, but Sandia’s very own car show has grown by leaps and bounds since then. The idea for the show was born when several folks realized that a lot of 10200 personnel were also classic car buffs and rebuilders. They thought it would be fun to have everyone bring in their big iron to show off to friends and colleagues and maybe win some bragging rights in the process.

Last year, 18 cars were entered in the show; this year, there were 57 entries from around the Labs, and more than 600 people came out to admire the cars.

In the photo at left, Kevin Dailey (10265-1), who has been at Sandia for just three months, wipes down the chrome wheel rim of his vintage 1967 Chevrolet Camaro SS. When Kevin bought the car 20 years ago, it had been totaled. Kevin rebuilt it and painted it himself and set it up for drag racing with a custom 414-cubic-inch small block engine. He doesn’t drive it on the street, but races it regularly at the Albuquerque Dragway.

Below, onlookers admire a classic 1957 Chevy Bel Air two-door hardtop coupe.



Energizing the Corps

Sandia teams with US Marines on microgrids and renewable energy planning



SANDIA RESEARCHERS NADINE MINER AND JOHN EDDY are collaborating with the US Marine Corps to help it make smart decisions on renewable energy planning with a powerful software tool called MDT, the Microgrid Design Toolkit. (Photo by Randy Montoya)

By Rebecca Brock

Members of the US Marine Corps are often the first boots on the ground in a crisis. On the front lines, they must be able to power up securely without plugging into utilities. They require nothing less than completely reliable and cost-effective energy independence.

Researchers from Sandia are collaborating with the Marine Corps to increase its energy security and reduce fuel dependence through alternative technologies, including renewable energy and microgrids. The Marine Corps Systems Command, Expeditionary Power Systems recently began a new effort with Sandia to develop analytic software tools that will give military decision-makers the quantitative support needed to achieve their long-term renewable energy goals.

“We are honored to partner with the United States Marine

Corps,” says Sandia project lead Nadine Miner (6114). “The modeling and optimization suite of tools that Sandia has developed will provide Marine Corps leaders with the information they need to help make decisions about which renewable energy technologies to invest in. The tools will also help them understand the impacts of their decisions. This project will help the Marine Corps invest taxpayers’ money wisely.”

The collaboration builds on modeling, simulation, and analysis work that Sandia began in 2012 with the Marine Corps’ Expeditionary Energy Office. The new endeavor takes advantage of Sandia’s breadth and depth of experience with microgrids — localized grids that generate and consume power and can run either independently or connected to the larger utility grid.

The project primarily uses a Sandia-developed software tool known as the Microgrid Design Toolkit (MDT), which allows microgrid designers to understand technology options and make smart decisions about technology solutions early in the design process. The software uses powerful search algorithms to identify potential trade-offs among factors such as cost, performance, and reliability.

Sandia computer scientist John Eddy (6133), one of the original developers of the MDT, is the project’s technical

lead. He says the tool’s unique multi-objective optimization offers many different solutions to build a system. On the new project, Sandia will customize the toolkit to enable the Marine Corps to make smart choices in planning investments in microgrids and renewable energy technologies, such as solar and batteries and, further down the line, wind.

Military and Energy Systems Analysis Dept. 6114 manager Alan Nanco says, “This project is an exemplary effort that aligns with the energy collaboration memorandum of understanding signed by DOE and DoD in 2010. It emphasizes the need to accelerate joint efforts in clean energy and national energy security technologies from national laboratories to military end users.”



A US MARINE RECHARGES BATTERIES in the field for small electronics using a lightweight solar portable system. Sandia engineers are working with the Marine Corps to help plan for such future renewable energy investments.

(Photo courtesy of the US Marine Corps)

Contract bid process

(Continued from page 1)

Jill said she expected the final RFP to be released soon, likely within days. A new contract will be in place by April 30, 2017.

During the Q&A session, Jill expressed confidence that the competition will have minimal impact on most Sandia employees but did offer a caveat: It is important, she said, that employees know and follow the rules governing the bid process to ensure that the competition goes forward without any missteps by anyone at the Labs. A document outlining those rules, Operating Instructions for Sandia Employees on DOE/NNSA’s Competition for the Management and Operation of Sandia National Laboratories, is available to Sandia employees on the Labs’ internal Techweb site.

‘One simple rule’

In response to a question about whether the relationship between Sandians and outside associates serving on review committees will be affected by the bid process, Jill said, “There is one very simple rule that we’re trying to make everyone aware of: Don’t talk about things that aren’t public — which means the details of your job, your boss, the program unit. During the contract competition phase just be a little bit more careful about things you might normally talk about because you don’t know why people are probing.”

During the bid phase, she added in specific response to

the question, there may be instances where associates from outside the Labs may need to recuse themselves for the duration of the competition, adding that those associations can be easily renewed once the process is completed.

“We’ll keep after this; I guess what I’d ask is that if you still have questions, please let us know. Let me know, let your VP know, because, look, we just want this lab to continue to be as great as it is.”

A couple of Sandians wondered what effect a new contract might have on represented employees. “Is there a possibility that the technologist positions will be unionized under a new management and operating contract?” one questioner asked. Another asked whether there would be a provision in the RFP to do away with unions at the Labs altogether.

Jill, with concurrence from Marianne, stressed that the RFP would not have such a provision. “The contractor doesn’t unionize; people unionize. It would be up to the technologist employees to unionize now or in the future. It is not up to Sandia Corporation, the parent company, or a new M&O.”

In response to another question about unions, Jill said there is no reason to believe there will be a change in the status of represented employees or non-represented

employees as the result of a new contract.

In addressing questions about the impact a new contract might have on Sandia’s benefits, Jill noted that the Labs’ existing benefits package is very tightly run and is on a very sound footing. With a nod from Jill, Human Resources Center 3500 Director Rob Nelson, who was in the audience, added that from a cost point of view, Sandia’s benefits package is already “very reasonable” compared to the packages offered by other national laboratories. That being the case, he said, there wouldn’t seem to be an incentive for a bidder to rework Sandia’s benefits package in a substantive way.

Jill also noted, regarding incentives, “The good news about the draft RFP is that it was a ‘best value’ RFP, it wasn’t a ‘low cost’ RFP. This is very important. During the last go-round they were looking for cost savings. This time around they’re looking for performance.” Assuming the final RFP takes a similar approach, she observed, the bidding teams will not necessarily be looking to show how they can cut costs, they will be trying to demonstrate that they can deliver excellent performance.

In a final comment after all questions had been addressed, Jill said, “We’ll keep after this; I guess what I’d ask is that if you still have questions, please let us know. Let me know, let your VP know, because, look, we just want this lab to continue to be as great as it is.”

The full Q&A session and a related list of FAQs regarding the contract competition and its impact on the Labs is available for viewing by Sandia employees on Sandia’s internal Techweb site.

The doctor is in

New medical director brings experience, reputation to the Labs

By Nancy Salem

Photos courtesy of Dr. Arthur Vall-Spinosa, MD

When Arthur Vall-Spinosa got out of medical school in the 1960s all doctors were being drafted. He had a choice between the Army and the Indian Health Service, and the decision was easy. “I had wanted to work with Native Americans,” he says. “So that’s what I picked.”

Art was assigned to a hospital in Tuba City, Arizona, on the Navajo Reservation. His work there shaped a career that saw him collaborate with many of the country’s leading pulmonologists at a time when the specialty, which deals with diseases of the respiratory tract, was making breakthrough strides. He helped advance the treatment of tuberculosis and other respiratory illnesses while being trained at some of the world’s leading institutions.

“I couldn’t have asked for a better career,” Art says. “I’ve enjoyed everything I’ve done. I love medicine and I love a new challenge.”

He has one now as director of Employee Health Services Center 3300 at Sandia. He’s the first physician to oversee the Labs’ health-care operations in almost a decade. “Our task is to keep the workforce healthy and on the job,” he says. “That’s a tall order, but I know we can do it.”

The son of a minister

Art almost didn’t go into medicine. While drawn to the profession, he knew it required long and odd hours. And he knew what that meant as the son of an Episcopal minister who moved around the Pacific Northwest. “My dad was a wonderful man but he was gone a lot, especially on the weekends when his kids were home,” Art says. “He was one of those ministers who built up a church and moved on to another. I respected his work while resisting that style of living.”

But Art loved biology and wanted to help people, a trait from his father. He decided in his junior year of college to become a physician. He earned an undergraduate degree from Whitman College in Walla Walla, Washington, then went to the University of Washington School of Medicine in Seattle. He did his residency at St. Luke’s Hospital in New York City.

Art was 28 years old when he chose to work at the Indian Health Service (IHS) hospital in Tuba City over an Army post in Vietnam, Germany, or Turkey. “Tuba City was a fantastic station,” he says. “It’s a wonderful location with wonderful people.”

The hospital, which served members of the Navajo and Hopi tribes, saw a lot of patients with tuberculosis, as well as lung damage from recurrent pneumonias and other respiratory ailments. Those experiences influenced his decision to be a pulmonologist.

The IHS sent him to train at Bellevue Hospital in New York City, National Jewish Health in Denver, and Royal Brompton Hospital in London, the top pulmonary programs



PATIENTS FIRST — Arthur Vall-Spinosa is Sandia’s new director of Employee Health Services. In a career spanning work in hospitals, private practice, academia, health-care management, and research, Dr. Vall’s real passion is taking care of patients.

at the time. He returned three years later a board-certified pulmonary specialist and was assigned to the IHS hospital in Albuquerque, which was a sanatorium for mostly Navajo tuberculosis (TB) patients.

Art put together a program, with help from the US Centers for Disease Control, to move everyone to outpatient treatment on the reservation, the modern approach to treating TB. “I got them all back home and flew out to the reservation two or three days a week in a small plane to hold clinics,” he says. “Most TB patients don’t need to be hospitalized or even isolated. We modernized.”

The sanatorium closed in 1972 and Art left the IHS after seven years to teach at the University of New Mexico School of Medicine. He and two other pulmonologists set up the first pulmonary specialty program at UNM. “I had a large grant from the National Heart and Lung Institute to teach lung disease to medical students, but my real passion was taking care of patients,” Art says. “You couldn’t do that in an

academic setting back then. It was publish or perish. I wanted to treat patients rather than do research papers.”

National learning curve of lung specialists

Art founded a pulmonary private practice in Albuquerque in 1976 that grew to nine physicians by the time he left it 20 years later. He was part of the formative years of pulmonology when flexible instruments such as bronchoscopes; breathing machines, or ventilators; critical care units; sophisticated technology to monitor how patients responded to treatment; and sleep labs were being developed.

“It was great to be part of a national learning curve of lung specialists. It was enjoyable, hard work,” he says. “But eventually I wanted to try something new.” He became chief of medicine in the Presbyterian Hospital system and medical director of its nursing homes for five years.

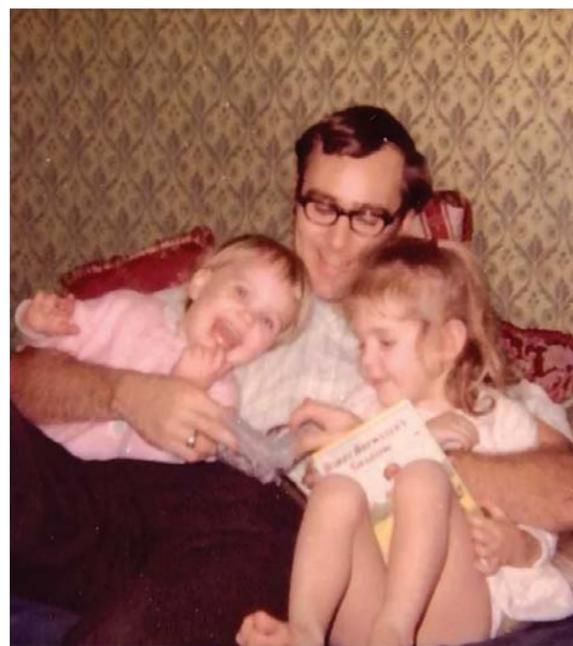
The doctor is in continues on next page



DR. VALL STOOD OUTSIDE Albuquerque’s Best Western Motel on Central Avenue on Aug. 11, 1965, his first day of work for the Indian Health Service.



THE INDIAN HEALTH SERVICE sent Dr. Vall to Bellevue Hospital in New York City in the late 1960s for training in pulmonary medicine.



FAMILY TIME on the Navajo Reservation was important to Dr. Vall and his kids. He spent seven years working at the Indian Health Service hospital in Tuba City, Arizona.

Culture, family, and friends in a remote corner of the world



A FEW FACES from Dr. Vall's years working on the Navajo Reservation.

By Arthur Vall-Spinosa, MD

I experienced two very different cultures as chief of internal medicine at the Tuba City Indian Hospital. In a long career, it was my favorite job.

The hospital is in the northwest corner of the Navajo Reservation, but we also served a nearby Hopi Indian village. The Navajo live in small, isolated family camps and tend flocks of sheep whose wool is used in the tribe's famous weavings. The Hopi live in villages and farm small plots of land in the surrounding countryside. Many Hopi men are silversmiths.

Tuba City had eight physicians — several became my lifelong friends — working in a 75-bed hospital with some outlying clinics. We lived next to the hospital so were able to spend lots of time with our families. Most of us had children while we were there.

We shared call, which meant that even as an internist I delivered 200 babies, covered the emergency room, assisted at surgery, treated kids, and was able to develop public health projects.

By a wonderful chance, our surgeon was Dr. Taylor McKenzie, the first Navajo physician. He later served as vice chairman of the Navajo Nation. Dr. McKenzie was an extremely accomplished surgeon and helped us gain insight into the Navajo culture. Many of the supporting staff were Navajo or Hopi, so we were truly immersed in a diverse community.

In the 1960s the major illnesses on the reservation were lung diseases and trauma. We saw very little heart disease, diabetes, and cancer. There were many unusual illnesses. For example, the pituitary glands of several women



Taylor McKenzie was the first Navajo physician. The accomplished surgeon, shown here with his wife, later became vice chairman of the Navajo Nation.

had infarcted due to massive blood loss at childbirth. The pituitary gland sends messages to other endocrine glands, so the condition manifested in unexpected ways. We saw it so often that it generated a scholarly paper in an obstetrics journal.



IN THE SPRING OF 1966, Dr. Vall, his wife, and daughter — clad in moccasins — enjoyed the beauty of the Tuba City, Arizona, area.

Other medical issues included hemophilia, snake bites, gall stones, and schizophrenia. Gall stone patients often came in with "hickies" on their abdomens because a Hopi medicine man failed to remove the stones by a technique known as sucking. We often consulted tribal medicine men

and added their ceremonies to our treatment plans. Occasionally, when I was unsure of a diagnosis or treatment, I flew to Albuquerque in a small plane with the patient for a consultation with a specialist.

The experience of working in Tuba City, away from a larger medical community and forced to make my own treatment decisions without advice from others, matured me as a physician and cemented my decision to become a pulmonary specialist.

It set me on a fascinating path.

It set me on a fascinating path.

New medical director

(Continued from opposite page)

Then Art fulfilled a lifelong dream. He bought a sailboat in Finland and over the next eight years worked in the winter and, from June to October, visited Scandinavia; traveled the canals of Europe; sailed around the British Isles; traveled down the Atlantic coasts of France, Spain, and Portugal, through the Strait of Gibraltar into the Mediterranean Sea; toured the coasts of Spain, France, Italy, and Greece into the Adriatic and Aegean seas and the coast of Turkey; and eventually sailed as far south as the island of Malta. "It was a wonderful period of my life," he says.

Art sold the boat in 2009 and worked as medical director of the Presbyterian Kaseman Hospital Skilled Nursing Facility until 2013, when he retired and turned to writing about



DR. VALL FULFILLED a lifelong dream to sail the waterways of Europe.

health care. "But I've always been excited about medicine, and I started looking for something new," he says.

Art started at Sandia in mid-January. He says he couldn't do the job without managers Anna DeCoste (3331), who runs the medical clinic, and Renee Holland (3334), who handles health maintenance and physical therapy. "They are incredible," Art says.

A long-time runner, Art likes to exercise and read historical novels and medical books. He's an avid outdoorsman who spent summers as a youth working in a camp at the foot of Mount St. Helens — long before its catastrophic eruption in 1980. He enjoys four-wheel treks, hiking, fishing, and skiing, activities he shared with his two daughters, one a family practice doctor and the other a teacher.

Now that the Sandia workforce can call Dr. Vall, as he's known, its doctor, what is his best advice to staying healthy? "Keep active, both physically and mentally," he says. "Don't smoke and don't be a couch potato."

Outstanding in his class

By Cathy Ann Connelly

Texas A&M University's Look College of Engineering has honored Sandia's Steve Rottler, deputy Laboratories director and executive VP for National Security Programs, as an Outstanding Alumni 2016.

The award recognizes former engineering students who have "brought honor to their profession by outstanding leadership in engineering activities, by enhancing the professional development of engineers, or by their creativity or ingenuity in the field of engineering."

With nearly 500 faculty members and more than 15,000 students, the Look College is the second-largest engineering school in the country, according to Texas A&M. The college is ranked seventh in graduate studies, ninth in undergraduate programs, and second in research expenditures among public institutions by *US News & World Report*, with 10 of the college's 14 departments ranked in the Top 10.

Steve, who previously served as Sandia's Chief Technology Officer and as VP of the California site, is a recipient of the Department of the Air Force Award for Exemplary Civilian Service. He is a Fellow of the American Association for the Advancement of Science and a Fellow of the American Institute of Aeronautics and Astronautics, a former member of its board of directors, and has served on several of its committees.

He has led and served as a member of advisory boards and independent review panels for government agencies, other national laboratories, and universities such as the Texas A&M Engineering Experiment Station and the System Engineering Research Center at Stevens Institute of Technology.

Texas A&M honors Steve Rottler as a distinguished alum



AWARD WINNERS — Steve Rottler, third from left, and other award recipients join Dwight Look College of Engineering Dean M. Katherine Banks, center, during recent ceremonies at Texas A&M. Honorees, from left, are Stuart R. Bell, president, the University of Alabama; Greg Garland, chairman and CEO, Phillips 66; Steve Rottler; M. Katherine Banks; Merri J. Sanchez, chief scientist, Air Force Space Command; Charlie Shaver, chairman of the board and chief executive officer, Axalta Coating Systems; and Christopher T. Rodenbeck, head, advanced concepts group, US Naval Research Laboratory, who was presented the 2016 Outstanding Early Professional Achievement Alumni Award.

Sen. Udall leads water technology roundtable

'Water is a crisis issue,' he tells local leaders

US Sen. Tom Udall, D-NM, hosted a roundtable with local leaders in water technology innovation including California Site Div. 8000 VP Marianne Walck on May 2 at Applied Technology Associates in the Sandia Science & Technology Park. Marianne leads Sandia's Energy and Climate Program Management Unit.

Udall called Sandia "a great national treasure with incredible research, technology, and development." He kicked off the discussion by saying, "Water is a crisis issue." The purpose of the roundtable, the senator said, was to encourage collaboration on solutions to long-standing challenges related to water.

Presenters included Sandia researchers Tom Lowry (6926) and Mike Hightower (6114). Tom's presentation focused on the work Sandia does in water systems modeling for decision support, and Mike discussed the depth and breadth of the Labs' work with water treatment technology research and development. Local developers, students, and business owners also participated in the roundtable.

In the photo at right, Udall emphasizes a point about water technology as Marianne looks on.

(Photo by Randy Montoya)



Sandia networking group marks National Day of Prayer

Photos by Randy Montoya

Sandia's Christians in the Workplace Networking Group (CWNG) marked the 2016 National Day of Prayer on May 5 with a celebration of praise and prayer at the Steve Schiff Auditorium. Among invited guests who led prayers were US Rep. Steve Pearce, R-NM, Albuquerque Mayor Richard Berry, Albuquerque Police Department Chief Gordon Eden, Sandia HR and Communications Div. 3000 VP Melonie Parker, local pastor David Eiffert, and Kirtland Air Force Base Chaplain Maj. Gregory Brunson.

Eden told a moving story about how on Sept. 11, 2001, he and Glenda Henry, a member of the God's House Choir, met on the Civic Plaza to pray for the nation's safety when it was under terrorist attack. The two have been prayer partners ever since.

The National Day of Prayer, an annual day of observance held on the first Thursday of May, was designated by the United States Congress in 1952. Each year since its inception, the president of the United States has signed a proclamation encouraging all Americans to pray on this day. In his 2016 proclamation, President Barack Obama stated, "Our country was founded on the idea of religious freedom, and we have long upheld the belief that how we pray and whether we pray are matters reserved for an individual's own conscience. On National Day of Prayer, we rededicate ourselves to extending this freedom to all people."

This year's Sandia event was chaired by CWNG members Carol Eiffert and Marie Miller. You can contact the group at cwng.sandia.gov.



Looking back

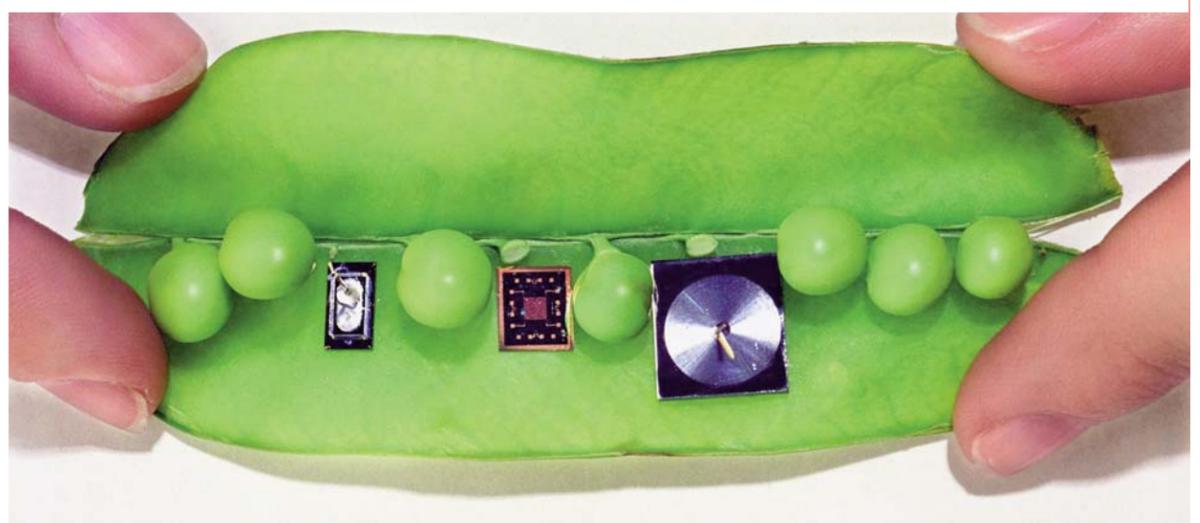
A micro device that is anything but small

By Holly Larsen

It was compact and light enough to fit in a hand. It harnessed the power of a full chemistry laboratory, detecting and analyzing toxic agents such as bacteria, viruses, and protozoa in minutes rather than hours. And it did its work using only minuscule amounts of sample and analytes. Introduced during the heyday of the late 1990s biotech boom, Sandia's μ ChemLab sparked major excitement at scientific conferences worldwide.

The micro device, created out of Sandia's first Grand Challenge Laboratory Directed Research and Development project, was a milestone on a strategic path to establish the Labs as a microfluidics authority. Grand Challenges pursue high-risk ideas with significant potential for national impact.

Sandia has enhanced the basic technology behind μ ChemLab, generated a multitude of patents, and garnered



THE THREE PRINCIPAL COMPONENTS of Sandia's μ ChemLab are small enough to fit inside a snow-pea pod.

(Photo by Randy Montoya)

national recognition, most recently a 2012 R&D 100 award for an entire integrated system for automated sample preparation and analysis of micro-liter volumes.

Since 2000, Sandia has attracted top minds and hundreds of millions of sponsorship dollars from several agencies to explore the value of the technology in an array of contexts, from addressing chemical and biological threats to rapidly diagnosing disease. Industry has taken note, joining Sandia in cooperative research and development agreements, some

leading to commercial products. And proving that innovation breeds innovation, the μ ChemLab has spurred a half dozen startup companies and unanticipated uses such as monitoring for gases released during fracking.

More than a decade after the first prototype was launched, the momentum remains strong as Sandia continues to receive funding for new applications of the microfluidics technology in national security, public health, and energy.

Green Breaks

Sandia Earth Day / Arbor Day tradition continues with annual tree planting

In recognition of Arbor Day, Center 3300 Director Dr. Arthur Vall-Spinosa, left, Div. 4000 Deputy VP Catherine Green, Div. 4000 VP Michael Hazen, and Div. 4000 financial analyst Rick Calvert (10594) took part in Sandia's annual tree planting ceremony on April 28. "As budget and resources allow, we've celebrated Arbor Day for many years," says Katrina Wagner (3652). "This is a collaboration between 4800, 4100, and HBE to promote Green Breaks and enhance our campus." Katrina says there are plans to create a more walkable campus by adding more trees around the Bldg. 956 field and by completing the Tech Area 1 Walking Look; both efforts are part of Sandia's Working Well Initiative. (Photos by Lonnie Anderson)



Nine projects receive Environmental Management System awards of excellence

By Lindsey Kibler

Sandia honored 43 members of the workforce at its annual Environmental Management System Excellence Awards on April 28. The award recipients developed nine projects aimed at conserving natural resources, minimizing the Labs' environmental footprint, and reducing, reusing, and recycling materials.

"This year we received a broad range of impressive nominations ranging from teams that enhanced our reduce, reuse, recycle principles to labs across Sandia whose clean-up and waste minimization efforts saved the corporation thousands of dollars and reduced risks," says EMS program coordinator Mike Nagy (4143).

David Blagg (1741) and Jonathan Snell (1011) received the Greenie Award for implementing nitrile glove recycling in their work area. Both identified an opportunity for waste reduction and, through management support, began diverting used, non-hazardous nitrile gloves into solid waste recycling. The Greenie Award recognizes individuals for going above and beyond for environmental stewardship outside of the job description.

Center 2700 piloted a new filtered cold water filling station and a filtered hot water tap in a break area of Bldg. 857 and earned the Grassroots Award. The cold water filling station was retrofitted into the existing water fountain area and eliminated the need to purchase bottled water from vendors, saving Sandia \$81 per month in purchases. Award recipients are Richard Elliot (2723), Justin Griffin (2723), William Lucy (2723), and Sam McCord (4144).

"The Grassroots Award is exactly as it sounds and celebrates a team that took it upon itself to make small changes that, if we all did them, would create a significant impact across the Labs," Mike says.



The Bldg. 37570 Energy Conservation Team received the Resource Conservation Award. The team reconfigured the 37570 Storage Facility to an unconditioned space, which resulted in an energy savings of 550 million British Thermal Units (BTUs) per year. The team members are Waylon Clark (4824), Edward Garcia (4824), John Garcia (4824), Gabriel Martinez (4821), John Porter (1682), Gregory Rochau (1683), Johnathon Shores (1682), Christopher Speas (1682), Eric Stockton (4824), Cynthia Stogsdill (4853), Robert Thoesen (4824), and Steve Trujillo (4824).

Kira Fishgrab (5642) received the Above and Beyond Award for her alternative sample mounting method project. The goal of the project was to test a new method of mounting samples for lapping and milling processes. The new method, which uses a double-sided thermal release tape instead of the current wax-based mounting, will reduce solvent use, decrease hazardous waste, save time, and increase thermal safety in the lab. The Above and Beyond Award recognizes individuals who put forth extra effort to preserve the environment.

The Sequoia Award is presented to individuals and teams whose projects impact the entire Laboratories and have a large reach. This year there was a three-way tie and the winners were chosen based on their strides toward meeting reduce, reuse, and recycle goals, says Mike. The following projects received the Sequoia Award:

- **The paper towel diversion pilot project.** After a waste study of Bldg. 823 was conducted, the pilot project began. Composting paper towels has diverted 40 pounds of waste a week from the landfill. The project is now at IPOC, as well. Members of this project are Charlene Argo (4848), Michael Barela (4848-6), Belinda Christakis (4848-6), Sam McCord (4144), Chris Romero (4848-6), and Ryan Raether (4848-5).

- **The mixed paper waste recycling project.** Custodial Services partnered with the Material Sustainability and Pollution Prevention (MSP2) program to improve environmental

stewardship and, in fiscal year 2014, took over managing approximately 125 mixed paper totes that were previously emptied on a volunteer basis. Under their management, mixed paper recycling has increased by 42 percent. The award recipients are Carl Anderson (4848-5), Charlene Argo (4848), David Baca (4848-6), Belinda Christakis (4848-6), Roy Cuoco (4848-6), James Griego (4848-4), Timothy Harrington (4848-4), Sam McCord (4144), Gloria Nieto (4848-4), Dorothy Saucedo (4848-5), and Lucy Saiz (4848-5).

- **The Lab News Waste Reduction Program.** A change to the distribution of *Lab News* was implemented and newspapers were delivered to strategically located racks rather than mail drops. Since 2013, the program has reduced the number of distributed newspapers by about 100,000 copies per year, increased readership, and developed a more streamlined process for the mailroom. Members of the program are Christina Chavez (10261-1), Michelle Fleming (3654), Catherine Homan (10261-1), Michael Lanigan (3651), Bob Locher (10261-1), Angela Romero (10261-1), Chrystal Sandoval (10261-1), David Veitch (10261-1), and Denise York (10261-1).

The group behind the emissions reduction at the MESA generators won the Environmental Stewardship Award for exemplifying the overarching EMS goal to minimize Sandia's environmental impact. The team identified the need for a more appropriate emissions testing plan for the MESA backup power generators to conserve resources and reduce air emissions. They developed a plan that was acceptable to the regulatory agency to ensure continuous compliance with emissions standards. The resulting revision of the site's air permit reduced air emissions and natural resource use and saved money. The award recipients are Penny Avery (4141), Kevin Baucom (1741), Joanna Eckstein (4143), Stacie Evelo (4141), Sean Rager (10265-1), Richard Simmons (4826), and Jonathan Snell (1011).

An honorable mention was awarded to Barbara Larsen (8516) and Carol Meincke (4855), who developed an on site electric vehicle charging station. They researched and implemented a pilot program to allow members of the workforce an alternative means of commuting.

"The EMS Excellence Awards have been a part of our program for a decade and in that time we have received more than 220 nominations, demonstrating that environmental excellence and continual improvement exist throughout the Laboratories," says Mike.

SANDIA CLASSIFIED ADS

MISCELLANEOUS

CANON LENSES & FLASH, EFS18-35 mm IS, EFUSM28-105 mm, QTech-10 70-300 mm, Speedlite 430EXII, excellent, \$250. Adams, 934-6294.

SNOW TIRES, 2, 235/75R15, studded, excellent tread, \$100; Isuzu/Toyota steel wheels, 4, 6-bolt, 31x10.50R16, excellent tread, \$200. Manko, 505-835-1213.

BEDROOM SET, brass w/mattress & box springs, night tables, dresser/mirror, \$950; sofa, \$350; Scandinavian home office set, \$550. Moonka, 307-4879.

TWIN BED & FRAME, w/new, never used, set of sheets, photos available, excellent condition, \$100 OBO. Mann, 505-604-4236, ask for Brandon.

INKJET INK, Epson CX, bottles on pkg., 3 colors, will give away. Steiner, 379-9977.

CHARITY GOLF TOURNAMENT, benefits charter school, May 14, Arroyo del Oso, register at www.coralcharter.com. Kotula, 505-400-4690.

TIMESHARE, Winter Park CO, sleeps 6, July 22-29, \$650/wk. Buck, 353-2667.

BENEFIT 5K RUN & 1 MILE WALK, Pinto Pride Fun Run, May 21, register at www.runningguru.com. Riblett, 505-269-4308.

HARLEY T-SHIRTS, never worn, new, XXL; Dell printers, computers w/o hard drives, all \$10 ea. Kilbane, 505-715-7681.

MULTI-FAMILY YARD SALE, May 27-29, clothes, kitchen appliances, etc., 613 Burma Drive NE, 87123. Myers, 505-217-5812.

5K FUN RUN/WALK, benefits Semper Fi/American's Fund, May 21, 9 a.m., Albuquerque Academy, www.ncmargc.org. Porter, 977-8312.

DINING SET, seats 6, 2 arm chairs, white-wash color, good condition, photo available, \$125 OBO. Dai, 505-990-9116.

SECURITY BARS, used, 24" x 24", 72" x 36", 60" x 48", 86" x 60", 96" x 42", 72" x 80" (sliding glass door) 2, 60" x 36", \$60. Rackley, 505-270-8449.

FABULOUS FELINES FREE LECTURE, feline nutrition & cat food ingredients, May 22, <http://fabulousfelines.org>. Stubblefield, 263-3468.

NINJA BASE UNIT, blender, food processor w/4 blades, dough mixer & 2 smoothie cups, nearly new, \$150. Tode, 505-235-2260.

MUSIC CABINET, 37"H x 19" x 16-1/2", 7 shelves, vintage sheet music (1868-?), \$50. Booker, 299-3554.

ON-EAR HEADPHONES, Sennheiser Urbanite, like new, \$50. Littlewood, 505-340-6824.

WHEELBARROW, great condition, \$30 OBO; accent chair, tan, some stains, otherwise good condition, \$40 OBO, in Rio Rancho, you haul. Fleming, 505-994-0808.

CARDIO BIKE, Inspire, A-1 condition, owner's manual, paid \$450, asking \$300 OBO. Castillo, 505-296-1861.

TRANSPORTATION

'06 NISSAN ALTIMA 2.5S, 4-cyl., tinted windows, green, 1 owner, 35K miles, runs great, good condition, \$6,000. Madrid, 505-412-1501.

'10 NISSAN MURANO, new tires, privacy glass, runs great, 69K miles, selling because family outgrowing, \$13,000 OBO. Perry, 463-6818.

'08 JEEP GRAND CHEROKEE LAREDO, V6, 4x4, all power, 140K miles, excellent condition, \$8,600. Luna, 505-503-5771.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:

- EMAIL: Michelle Fleming (classesads@sandia.gov)
- FAX: 844-0645
- MAIL: MS 1468 (Dept. 3651)
- INTERNAL WEB: On internal web homepage, click on News Center, then on Lab News link, and then on the very top of Lab News homepage "Submit a Classified Ad." If you have questions, call Michelle at 844-4902.

Because of space constraints, ads will be printed on a first-come basis.

Ad rules

1. Limit 18 words, including last name and home phone (If you include a web or e-mail address, it will count as two or three words, depending on length of the address.)
2. Include organization and full name with the ad submission.
3. Submit ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. One ad per issue.
6. We will not run the same ad more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active Sandia members of the workforce, retired Sandians, and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. We reserve the right not to publish any ad that may be considered offensive or in bad taste.

'95 CUTLASS SUPREME LS, 4-dr., 53K original miles, well maintained, reliable, nice interior, \$1,900 OBO. Maxwell, 301-4809, ask for Jim.

'91 GMC 3500, 15-passenger van, front & rear AC, well maintained, 163K miles, great for camping, \$2,500. Bodette, 505-275-9722.

'72 HONDA 600 COUPE, original owner, 148,120 miles, 2-cyl. air-cooled engine, \$9,500. Stang, 286-9049.

'06 MUSTANG GT CONVERTIBLE, V8, 5-spd., manual, leather seats, metallic, 110K highway miles, \$9,900 OBO. Jean-Luc, 404-944-2264, ask for Albert.

'11 HONDA CIVIC EX COUPE, red, premium sound/wheels, new tires, 66K miles, great condition, \$11,000. Craig, 575-607-5528.

'09 SMARTCAR PASSION, loaded, 40-mpg, 40K miles, excellent, \$6,900 OBO. Sturgeon, 505-975-6565.

'85 MERCEDES BENZ 300D, turbo diesel, new engine mounts, rear axles, 192K miles, runs well, \$3,000. Buck, 505-459-2107.

RECREATION

'08 SEADOO WAKE, 215-hp PWC, <10 hrs., iCatch walk around trailer, many extras, new battery, \$6,250. Fondren, 463-5572.

'86 HARLEY FXSTC SOFT TAIL, maroon, new pipes, 42K miles, must sell, \$5,500 OBO. Romero, 505-307-9389.

'07 YAMAHA VENTURE TOURING MOTORCYCLE, radio, CB, intercom, aux, cruise, V4 engine, 14K miles, great condition, \$8,500. Cardenas, 505-220-0835.

KID'S BIKE, Adams Trail-a-Bike, 5-spd., good condition, \$60. Weber, 553-2118.

REAL ESTATE

4-BDR. HOME, 4-car garage, close to Sandia, refrigerated air, upgraded windows, drapes, xeriscaped, alarm, move-in-ready, price lowered, \$230,000. Rogulich, 459-6241.

3-BDR. CUSTOM HOME, 2 baths, 2,476-sq. ft., 2.45 acres, East Mountains, brochure available, \$425,000. Logan-Condon, 281-1724.

3-BDR. HOME, 2-1/2 baths, 2-car garage, 2,100-sq. ft., gated community, near Southern & Juan Tabo, \$245,000. Martin, 505-440-9689.

3-BDR. HOME, 2 baths, 1,384-sq. ft., 2-car garage, completely remodeled, granite counters, all new appliances, forced HVAC, \$215,000 OBO. Sanchez, 505-293-7246, ask for Alicia.

WANTED

HOME TO RENT, new hire needs 3-bdr., 2 bath, 2-car garage, nice neighborhood, starting in July, would consider housesitting. Bonham, 817-266-7076.

ROOMMATE, 2-bdr. apt., NW of 140 & Coors, call for details, \$335/mo. plus half gas/electric. Petraglia, 720-291-7210.

PUSH MOWER, reasonably priced, for older lady. Colgan, 344-3776.

HOUSEMATES, 2, share renovated home near Arroyo del Oso, no smoking or pets, starts July 1, \$475 or \$525, plus 1/3 utilities. Smith, 505-264-3736.



Mileposts

New Mexico photos by Michelle Fleming

		
Dahwey Chu 40 1718	Laney Kidd 30 5568	Lori Kozlowski 30 9517

Recent Retirees

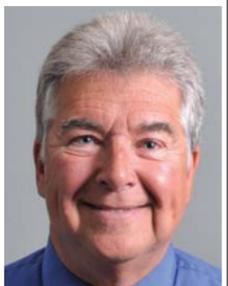
New Mexico photos by Michelle Fleming


Vernon Koonce 42 6521

			
Vipin Gupta 20 6124	Ashley Amparan Pena 15 2982	Jeremy Cordova 15 5781	Leonard Dixon 15 5335

		
Jaye Bullington 40 6925	Phil Rodacy 38 2555	Cindy Lucero 37 10519

			
Michael Enghauser 15 6634	Katelyn Milesoshky 15 10655	Tom Pfeifle 15 2552	Gary Shoemaker 15 2542

		
Alice Maese 31 751	Anthony Wagner 30 5555	Jerry Langheim 28 5030

Take Our Daughters and Sons to Work Day / Earth Day

By Rebecca Brock
Photos by Lonnie Anderson

Sandia/New Mexico hosted 1,588 students across the Labs on April 28 for a combined celebration of Take Our Daughters and Sons to Work Day plus Earth Day. Students grade 5-12 came with parents, friends, and relatives to learn more about their hosts' work and Sandia's mission. Students enjoyed more than 40 energizing activities around the Sandia campus with the goal of inspiring the next generation of leaders in science, technology, engineering, and math (STEM) careers. The range of STEM events for the students included hands-on tours of laboratories, panels discussions, a tree planting for Earth Day (see page 10), and at the Solar Tower, the baking of more than 1,500 cookies using a solar oven.

One dad said, "Getting the tour of the silicon fab, the supercomputers, and the solar tower set my boy's mind on fire. This experience ignited the conversation with my son on what it takes to do what we do here. For a seventh-grader who hates math, that is a pretty big win!"

The all-day event was organized by Roberta Rivera (3652) of Community Involvement. Roberta says, "We are immensely grateful to all of the volunteers and hosts who coordinated events this year. We would like to thank all members of the workforce who brought a child, whether the person was their son, daughter, relative, or friend."

